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<p>(54) Title: ANIMAL WASTE COLLECTION</p> <p>(57) Abstract</p> <p>A device (2) for collecting faeces of dogs and cats, and other waste matter, includes a hollow tubular member (4) and means (16) for creating a partial vacuum therein to suck up the matter into a plastic bag (40). The plastic bag (40) is apertured (48) to permit the partial vacuum to be transferred to the interior of the bag. A disposable one-way device (50) prevents collected waste matter from falling out. An energy storage compression spring (32) enables a piston (30) to create the partial vacuum merely on release of the spring, whereby one-handed operation is rendered possible.</p>			

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ANIMAL WASTE COLLECTION

This invention relates to apparatus particularly but not exclusively for use in collecting animal droppings and other waste matter.

It is a well-known problem that where animals, particularly dogs and cats, are exercised freely out of doors, they tend to leave behind them collectively a very considerable amount of excrement. Particularly in cities and public places, this excrement is not only a nuisance but is known to carry disease and children have been known to suffer unduly in some cases by blindness, resulting from contacting animal faeces.

Such fouling of pavements, sidewalks and public places is now a punishable offence in many towns and cities, and cleaning up and disposing of a dog's faeces is required by law.

To that end pet owners have sometimes used a plastic bag to assist in collecting the faeces without the need to come into manual contact with them and various means have been provided to hold the plastic bag. One problem with that method is that the dog owner needs to bend down close to the ground in order to pick up the pet's droppings, which in some cases requires undue physical effort and in other cases is objected to because of the unpleasantness of the nearness of the operation.

Other factors in this regard include the fact that prior proposals in this field have in many cases been relatively complicated to operate, such as requiring the use of both hands of the user, and there has also been a tendency in the case of some devices for the gathered material to be dropped after initial operation of the device.

Attempts have been made to overcome these objections by providing faeces collecting devices having a long reach in order to pick up a dog's droppings without stooping or coming into near contact therewith, and with other features, but

these proposals fall short of requirements in various ways.

British Patent Application 8914480.2, published as GB 2233218A discloses a device for collecting animal excrement which includes a battery operated fan to create a suction effect in order to draw excrement into a container and retention device. This arrangement is complicated, unacceptably heavy and requires maintenance in the form of battery charging or replacement and is consequently unduly expensive to make and maintain.

US patent 4078838 discloses a long-handled tubular device having a plunger or piston which grips the closed end of a plastic bag. Pulling on the end of a piston rod fixed to the plunger is said to withdraw the plastic bag into the tube. The suction thus created together with a dragging effect of the plastic bag withdraws the faeces and the bag into the tube. With this arrangement it is difficult to assemble the plastic bag into the plunger and furthermore if the excrement is not all withdrawn into the bag in one operation, then the bag and its contents have to be unloaded and replaced by a second bag.

An object of the present invention is to provide a method and apparatus for picking up waste matter, such as pet droppings, which is simple and uncomplicated to operate and/or permits one-handed operation and/or incorporates improved means for retention of picked-up matter and/or requires little or no maintenance and/or is inexpensive to manufacture and/or provides improvements generally therein.

In accordance with the invention there is provided a device for picking up animal and other waste matter, and a corresponding method, as defined in the accompanying claims.

In a described embodiment, a device for picking up waste matter comprises means for applying suction to, or creating a partial vacuum within, a hollow tubular member, whereby the waste matter is sucked into the tubular member. The suction is applied by slidable plunger means reciprocatable within a first or upper chamber. The latter chamber is connected to

a second or lower chamber to which the suction is applied. The lower chamber has an open end for receiving the waste matter. A plastic bag or like sheet material envelope is placed over the open end of the lower chamber and extends into the chamber. The bag has perforations to allow the suction or partial vacuum to be transmitted into the interior of the bag during use. Thus, in use, a partial vacuum is created within the bag whereby the waste matter is drawn into the bag in the lower chamber.

A disposable one-way device is mounted at the open end of the lower chamber. The one-way device permits the waste matter to pass through it and into the bag within the lower chamber, while preventing the waste matter from subsequently dropping back.

The provision in a suction type waste matter collection device of a perforated matter collection envelope permits the creation within the envelope of a partial vacuum and the actual suction into the envelope of the waste matter. Previous proposals have been unable to create suction or a partial vacuum within the collection envelope.

Likewise, the provision of a disposable one-way device through which the waste matter passes, and which permits the passage therethrough of air for the suction of waste matter into the collecting envelope enables the collected matter to be safely retained, while not interfering with the proper action of the suction device. By constructing the one-way device of paper or plastics sheet material so as to be disposable, the advantages of direct and effective action on the matter to be collected are combined with economy and simplicity.

In the described embodiment, the plunger is arranged to be actuated by stored energy means in the form of a compression spring whereby single-handed operation is rendered possible. Compression of the spring stores energy whereby, on release, the plunger creates suction and a partial vacuum as described above, without the need for any appreciable

mechanical input from the user. It would even be possible to provide holding means to retain the spring in its compressed condition for subsequent release when desired, for certain applications. In this way, simple one-handed operation of the device is rendered possible.

Various embodiments of an animal waste collecting device in accordance with the invention will now be described, by way of example only, with reference to the accompanying drawings in which :

Figs 1, 2 and 3 are section views of one embodiment of the invention in various stages of operation;

Fig 1A is a scrap section view of a modification of part of Fig 1;

Fig 4, 5 and 6 are section views of a second embodiment;

Fig 7 is a perspective view of a collecting bag for use with the device, and

Fig 8 is a perspective view of an excreta retaining device for use in co-operation with the collecting bag.

In the embodiment seen in Figs 1, 2 and 3 a device 2 comprises a tubular member 4 having a bell mouth 6. A transverse plate 8, retained in position by suitable circlips 10, separates the tubular member into upper and lower cylinders 12 and 14 respectively.

A second tubular member 16 having an internal diameter somewhat greater than the external diameter of the tubular member 4 is located co-axially and around that tube, the difference in diameters defining a passageway 18.

The uppermost end of the tubular member 16 is formed with a shoulder 19 and a plate 20 is located against that shoulder, being retained in position by a circlip 22. The uppermost end of the tubular member 16 is also enlarged in diameter to form a canister 24, closed by a screw cap 26.

A rod 28 depends downwardly from the plate 20 and is formed at its lower end as a piston 30 which fits closely within the upper cylinder 12 of the tubular member 4. A compression spring is located between the piston 30 and the

plate 8 within the cylinder 12 and the plate 8 is formed with a one-way valve 34. A similar one-way valve system 36 is provided on the piston 30 and an inturned lip 38 at the uppermost end of the tubular member 4 retains the piston within the cylinder 12.

In the alternative arrangement seen in Fig 1A, the piston 30 is fitted with a cup-washer which eliminates the need for a one-way valve.

A plastic bag 40, seen clearly in Fig 7, is formed with tails 42 at its open end 44 and towards a closed end 46 is provided with a number of small diameter perforations 48.

An excreta retaining device 50, seen clearly in Fig 8 is formed with an outwardly and upwardly extending rim portion 52 and an inwardly and upwardly extending cone portion 54 slit severally at 56 to allow passage therethrough, in one direction in the manner of a one-way valve, of excreta during operation of the device.

The canister 24 at the uppermost end of the tubular member 16 may be used to conveniently store and carry a supply of bags 40 and retaining devices 50 as illustrated in Fig 1.

In use, a bag 40 is inserted into the cylinder 14 with the perforated closed end uppermost and the tails 42 are turned outwardly and upwardly around the bell mouth 6. A retaining device 50 is then placed over the bell mouth, the cone portion 54 being inserted within the open end of the bag 40 and the rim 52 being positioned around the outside of the bell mouth. The bag and the retaining device are both retained in position by an elastic band 58.

The device is then placed with the bell mouthed end over the offending dogs droppings as seen in Fig 1 and pressure is applied to the topmost portion via the cap 26. This causes the piston to compress the spring 32 and air which was present in the cylinder 12 passes through the one-way valve 34 in the plate 8 being closed. The air flows in the direction of the arrows A through the passageway 18 between the tubular members 4 and 16, exhausting to atmosphere as indicated by the arrows

B.

Release of manual pressure on the cap 26 allows the spring 32 to return the piston to its original position towards the uppermost end of the tubular member 4. This creates a partial vacuum within the cylinder 12, drawing air upwardly through the perforations 48 in the bag 40 and through the open one-way valve 34 in the plate 8. The vacuum effect thus created in the bag 40 sucks the animal droppings D through the slit conical member 54 into the bag 40 where it is retained by the one-way valve effect of the retaining member.

When the droppings have all been collected, the bag and retaining member, complete with collected droppings, are removed and disposed of in a suitable bin, the tails 42 being tied together to close the open end of the bag to retain its contents.

In the alternative embodiment shown in Figs 4, 5 and 6, a short tubular member 104 having a bell mouth 106 is closed at its upper end by an end plate 108 which is provided with a one-way valve 134. A convoluted tube 116 is secured at its lowermost end to the end plate 108 and at its uppermost end to a flange 127 on a rod 128.

One-way valves 136 are provided in the convoluted tube and the operation of removing and collecting pets droppings D is performed as in the previous embodiment, except that the vacuum suction effect is created by first pressing down on the rod 128 to expel air from the convoluted tube 116 through the one-way valves 136 whilst the valve 134 is closed. Release of pressure on the rod 128 allows the convoluted tube to revert to its original position drawing air through the perforations in the bag and through the one-way valve 134, thus sucking the pet droppings D through the retaining member 50 into the plastic bag 40 as previously described with respect to the first embodiment.

With the device according to the invention animal droppings and other waste matter may be removed from the

ground without the need for the user to stoop low and whilst operating the device with one single hand. Furthermore, the device is simple to operate and may be repeatedly actuated until the retaining and storage bag is full.

If so desired the top part of the tubular member 16 of Figs 1, 2 and 3 and of the rod 128 of Figs 4, 5 and 6 may be in the form of a walking stick handle.

CLAIMS :

1 A device for picking up animal and other waste matter comprising a hollow tubular member having one open end and adapted to receive and retain the waste matter, and including means for creating a partial vacuum within the hollow tubular member, whereby the waste matter may be sucked into the tubular member.

2 A device according to claim 1 comprising a hollow member having upper and lower chambers, the lower chamber having one open end, a divider plate separating the upper and lower chambers and means for creating a partial vacuum within the upper chamber to cause air to be drawn therein from the lower chamber in order to suck waste matter into the lower chamber.

3 A device according to claim 2 wherein the divider plate is provided with a one-way valve to allow air to pass from the lower chamber to the upper chamber, but not from the upper chamber to the lower chamber.

4 A device according to claims 2 or 3 wherein the upper chamber is a first cylinder having a piston slideable axially therein towards and away from the divider plate, and wherein the piston is provided with a one-way valve arrangement to allow air to pass from the first cylinder when the piston is moved axially towards the divider plate.

5 A device according to claim 4 wherein the piston is connected to and movable with a second cylinder member coaxial with and located around the first cylinder so as to define a passageway between the first and second cylinders whereby air may be emitted from within the second cylinder through the passageway.

6 A device according to claims 4 and 5 wherein a

compression spring is located between the piston and the divider plate.

7 A device according to claims 5 and 6 wherein the piston is connected to the second cylinder by means of a piston rod.

8 A device according to claims 5, 6 and 7 wherein downward axial movement of the second cylinder causes air within the first cylinder to be evacuated through the one-way valve arrangement in the piston the passageway between the first and second cylinder raises the piston to create a partial vacuum in the first cylinder and cause air to flow from the lower chamber through the one-way valve into the first cylinder.

9 A device according to claims 1, 2 and 3 wherein the upper chamber is a flexible concertina-like member.

10 A device according to claim 9 wherein the flexible concertina-like member is provided with at least one one-way valve to allow air to pass from within the flexible member to atmosphere.

11 A device according to claims 9 or 10 wherein the flexible member is connected to a manually operable rod whereby downward movement of said rod causes collapsing of the flexible member to evacuate air therefrom via the at least one one-way valve and upward movement of said rod creates a partial vacuum within the flexible member to cause air to flow through the one-way valve in the divider plate from the lower chamber into the flexible member.

12 A device according to any or all of the above claims wherein there is further provided a bag-like receptacle which is located within the tubular member and into which the waste matter may be sucked during operation of the device.

13 A device according to claim 12 wherein the bag-like receptacle has one open end portion locatable around the open end of the lower chamber.

14 A device according to claims 12 and 13 wherein the bag-like receptacle has a closed end portion distal from the open end portion and where perforations are formed adjacent the closed end portion to allow air to pass from within the bag through the one-way valve in the divider plate into the upper chamber.

15 A device according to any one of claims 12 to 14 wherein there is provided a waste matter retaining device adapted to fit within the receptacle to allow the waste matter to pass into the receptacle and to retain it therein.

16 A device according to claim 15 wherein the retaining device has a cone shaped portion adapted to fit within the receptacle and an upturned rim portion adapted to fit outside the open ends of the lower chamber and wherein the cone shaped portion is formed with slits to allow passage therethrough of the waste matter into the receptacle but not out of the receptacle.

17 A device according to any one of the claims 12-16 above wherein the second cylinder is formed with a canister for storage of bag-like receptacles for use with the device.

18 A device according to any one of the preceding claims characterised by the provision in combination with said device of a flexible envelope to receive said waste matter, said envelope being formed with perforations to permit said partial vacuum to be transmitted to the interior of said envelope to enable said waste matter to be drawn therein.

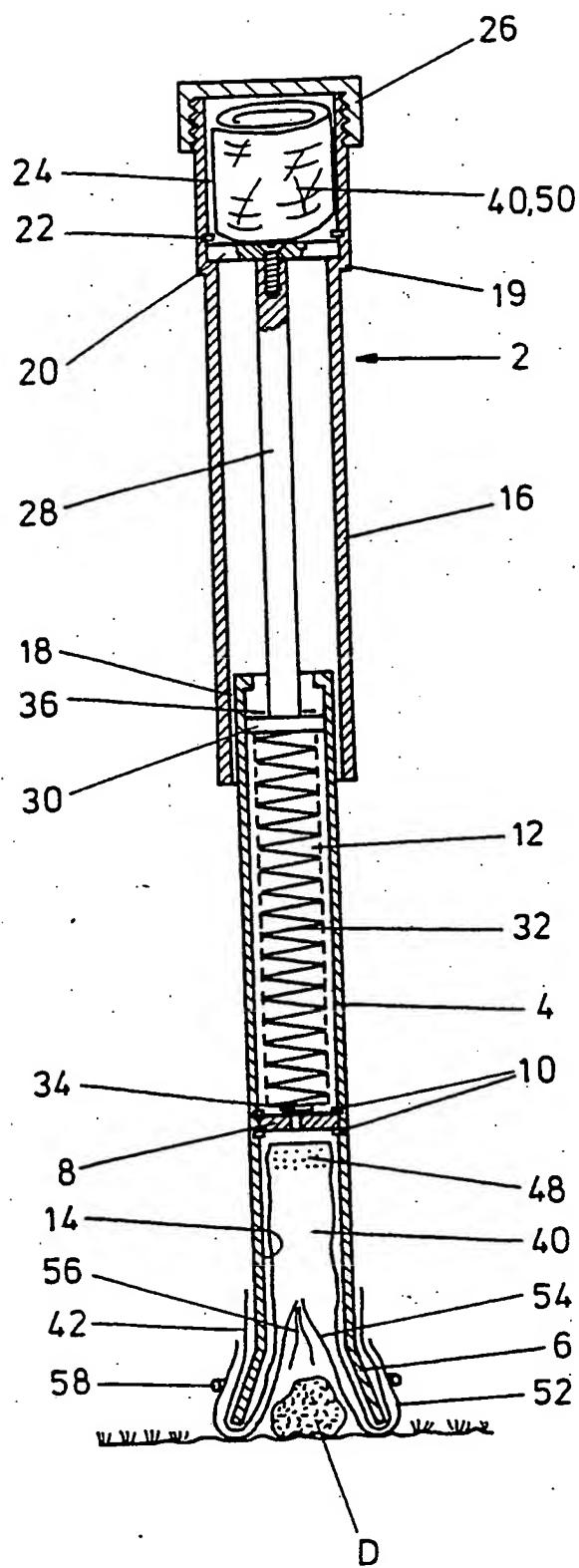
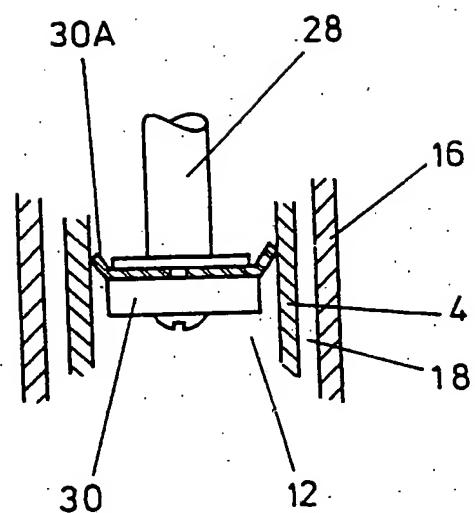
19 A device according to any one of the preceding claims

characterised by the combination with said device of a disposable one-way matter retaining means adapted to permit said waste matter to pass through said retaining means, and likewise air moving towards said partial vacuum, while inhibiting or preventing the return movement of said waste matter.

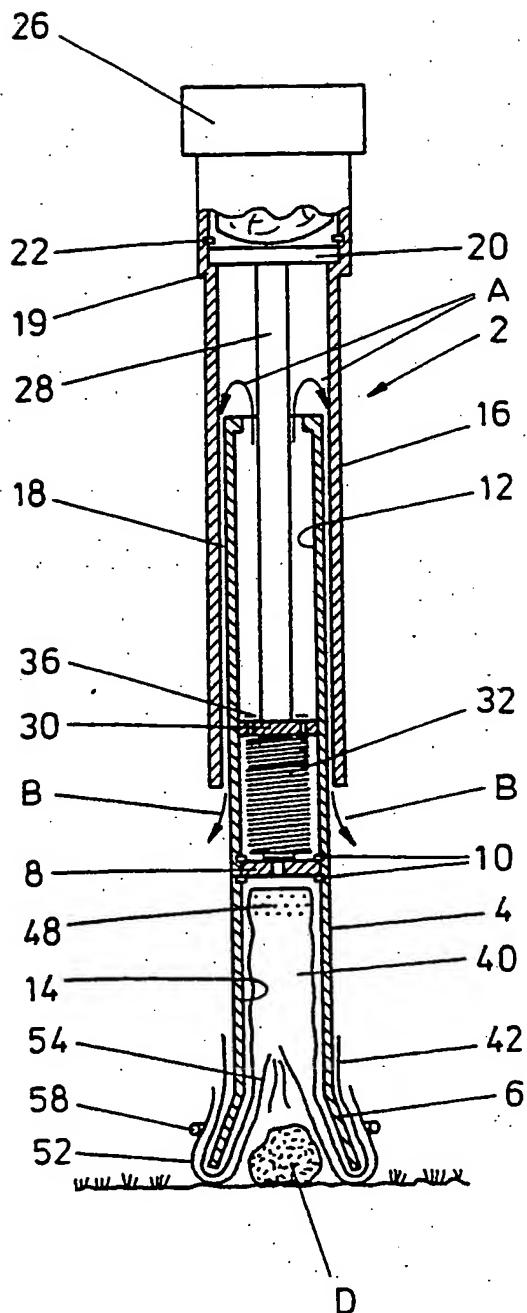
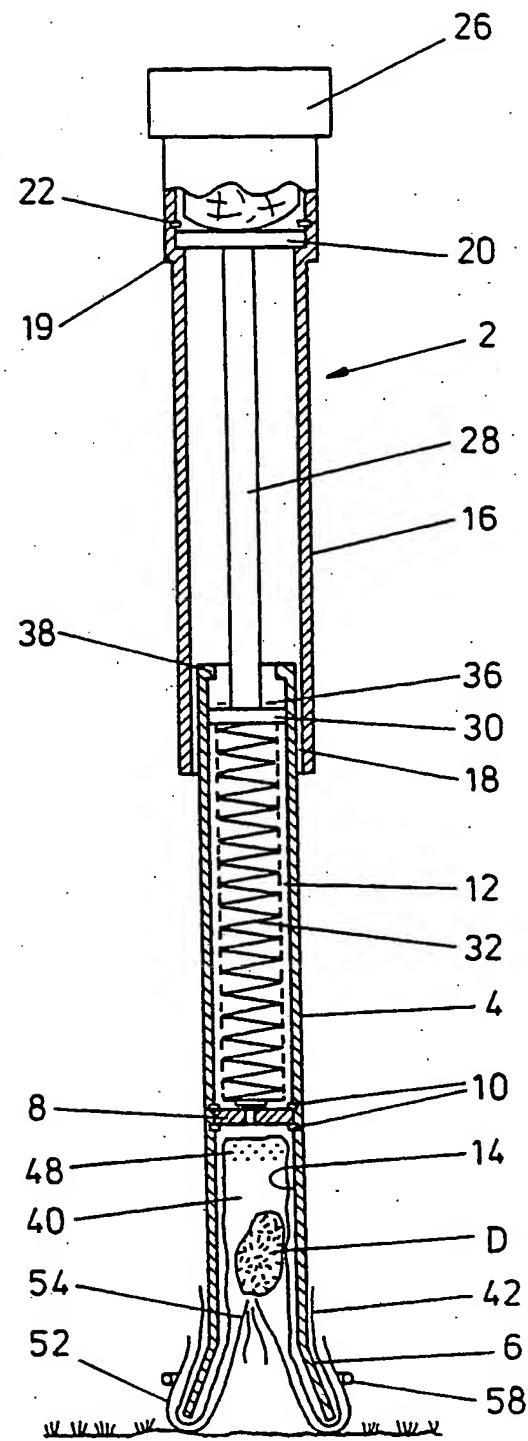
20 A device according to any one of the preceding claims characterised by a plunger or piston to create said partial vacuum and energy storage means to actuate said plunger or piston, said energy storage means being actuatable by downward pressure on said device.

21 A device according to claim 20 characterised by said energy storage means comprising a compression spring.

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FIG. 1FIG. 1a

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FIG. 2FIG. 3

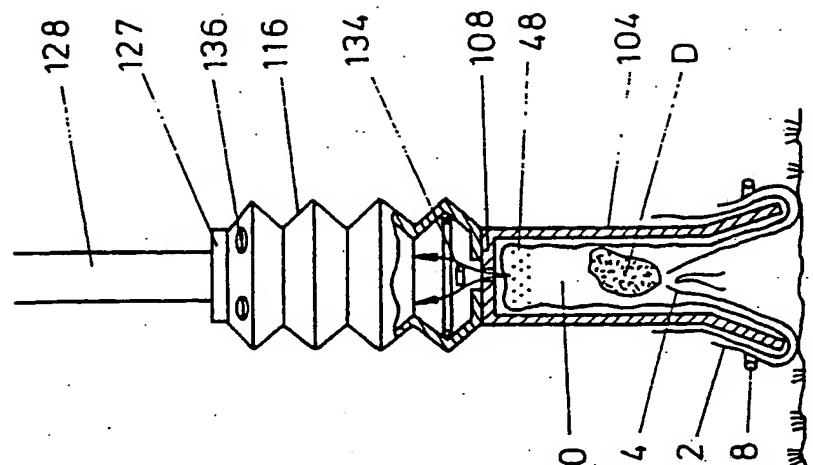


FIG. 6

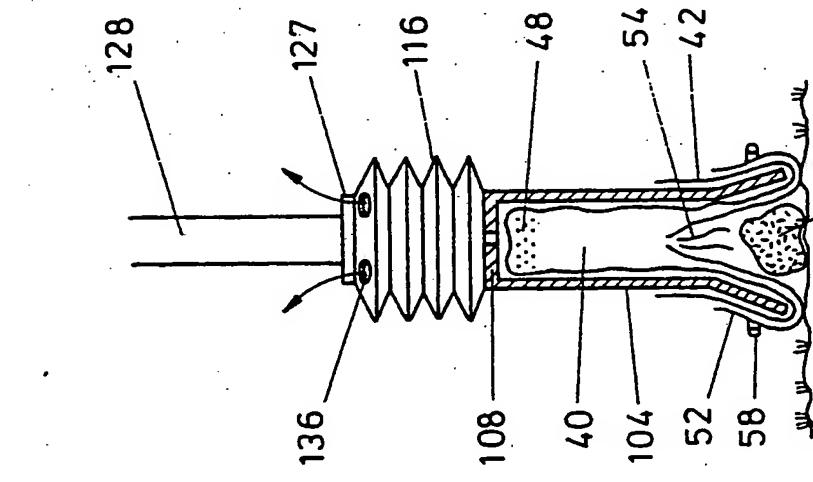
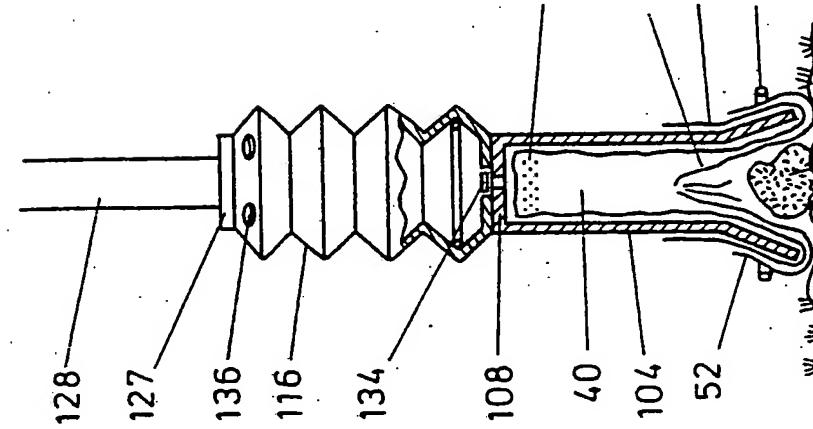


FIG. 5



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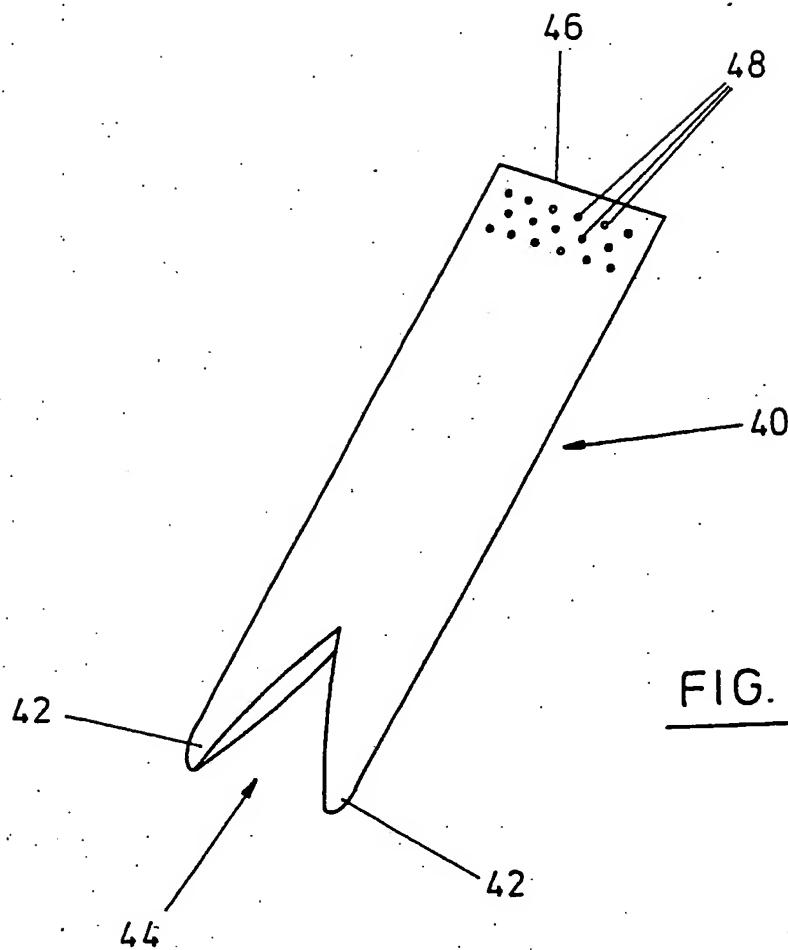
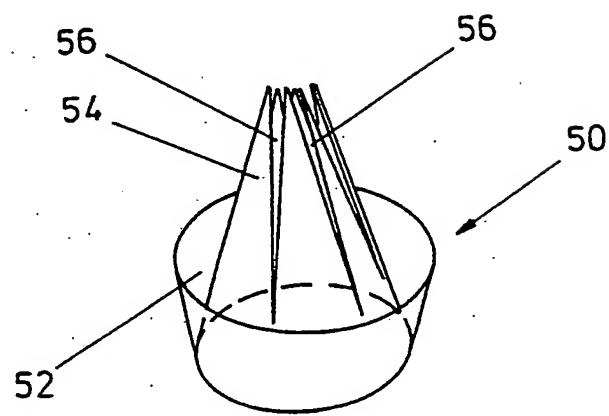


FIG. 8



INTERNATIONAL SEARCH REPORT

PCT/GB 93/00654

International Application No

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)⁶

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.C1. 5 E01H1/12

II. FIELDS SEARCHED

Minimum Documentation Searched⁷

Classification System	Classification Symbols
Int.C1. 5	E01H

Documentation Searched other than Minimum Documentation
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Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	FR,A,2 648 837 (MARCO POLO IND. AND MERCH.) 28 December 1990 cited in the application see the whole document	1,12,13, 19
A	US,A,4 078 838 (NADRATOWSKI) 14 March 1978 cited in the application see the whole document	2,8
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IV. CERTIFICATION

Date of the Actual Completion of the International Search

25 JUNE 1993

Date of Mailing of this International Search Report

25 JUNE 1993

International Searching Authority

EUROPEAN PATENT OFFICE

Signature of Authorized Officer

DIJKSTRA G.

ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.

GB 9300654
SA 72612

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Patent document cited in search report	Publication date	Patent family member(s)		Publication date
FR-A-2648837	28-12-90	GB-A- DE-U-	2233218 9006940	09-01-91 22-11-90
US-A-4078838	14-03-78	None		
US-A-4485971	04-12-84	None		
US-A-4819977	11-04-89	None		

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